

Attorney Docket 55434US002
U.S.S.N. 09/591,584

Listing of Claims:

1. (Previously presented) A laminate attached to window glass to provide a glazing element which has reduced spall and lacerative consequences on impact fracture of the window glass; said laminate comprising:
 - (a) a first lamina comprised of visible light transmissive flexible nonadhesive polymeric material having a first major surface and an opposite second major surface;
 - (b) a scratch-resistant layer over said first major surface to provide an exposed surface to the laminate;
 - (c) at least one additional lamina comprised of visible light transmissive flexible nonadhesive polymeric material;
 - (d) a sufficient number of layers of in situ visible light transmissive pressure sensitive adhesive layers to bond said laminae together with the scratch-resistant layer exposed; and
 - (e) a layer of in situ visible light transmissive ambient temperature attachable pressure sensitive adhesive to bond said laminate to window glass, wherin the total thickness of the laminate exceeds about 5 mils and the laminate exhibits a light transmittance.
2. (Previously presented) The laminate attached to window glass of claim 1 wherin each of said laminae has a thickness no greater than about 5 mils (0.13 mm).
3. (Previously presented) The laminate attached to window glass of claim 1 wherein each of said laminae is comprised of biaxially oriented polyester film.
4. (Previously presented) The laminate attached to window glass of claim 1 wherein said pressure sensitive adhesive is comprised of acrylic based copolymer.
5. (Previously presented) The laminate attached to window glass of claim 1 further including a third lamina comprised of visible light transmissive flexible non-adhesive polymeric material.

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6. (Previously presented) The laminate attached to window glass of claim 1 wherein the scratch-resistant layer comprises a cured ceramer.
7. (Previously presented) The laminate attached to window glass of claim 1 wherein said window glass comprises tempered or laminated window glass, said laminate and window glass define a glazing element which passes the following ANSI Z-26 tests:
 - 5.04 - Two Hour Boiling Water;
 - 5.13 - Thirty Foot (9.14 m) Ball Drop;
 - 5.17 - Resistance to Abrasion;
 - 5.19 - Chemical Resistance; and
 - 5.23 - Flammability.
8. (Previously presented) The laminate attached to window glass of claim 1 wherein said pressure sensitive adhesive layers are comprised of pressure sensitive adhesive having a shear storage modulus measured at 22°C in the range of about 0.20 Mpa to about 0.50 Mpa.
9. (Previously presented) A glazing element which has reduced spall and lacerative consequences on impact fracture, said glazing element comprising:
 - (a) a laminate comprising a first lamina comprised of visible light transmissive flexible polymeric material having a first major surface and an opposite second major surface; a scratch-resistant layer over said first major surface; at least one additional lamina comprised of visible light transmissive flexible nonadhesive polymeric material; a sufficient number of layers of in situ visible light transmissive pressure sensitive adhesive layers to bond said laminae together with the scratch-resistant layer exposed; a layer of in situ visible light transmissive ambient temperature attachable pressure sensitive adhesive to bond said laminate to window glass; wherein the total thickness of the laminate exceeds about 5 mils and the laminate exhibits a light transmittance; and
 - (b) window glass.
10. (Original) The glazing element of claim 9 wherein said window glass is tempered.

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11. (Original) The glazing element of claim 9 wherein said pressure sensitive adhesive layers are comprised of pressure sensitive adhesive having a shear storage modulus measured at 22°C in the range of about 0.20 MPa to about 0.50 MPa.
12. (Previously presented) A laminate comprising the following components adhered together in the following order:
 - (a) a scratch-resistant layer comprised of cured ceramer;
 - (b) a first biaxially oriented polyester film having a thickness of not more than 5 mils (0.13 mm);
 - (c) a first pressure sensitive adhesive layer;
 - (d) a second biaxially oriented polyester film having a thickness of not more than 5 mils (0.13 mm);
 - (e) a second pressure sensitive adhesive layer;
 - (f) a third biaxially oriented polyester film having a thickness of not more than 5 mils (0.13 mm); and
 - (g) a third ambient-temperature-attachable pressure sensitive adhesive layer; wherein said pressure sensitive adhesive layers are comprised of pressure sensitive adhesive having a shear storage modulus measured at 22°C in the range of about 0.20 MPa to 0.50 MPa.
13. (Previously presented) The laminate attached to window glass of claim 1, wherein each of said visible light transmissive pressure sensitive adhesive layers comprises an adhesive sufficient to maintain the laminae together through the ANSI Z-26 test: 5.04 – Two Hour Boiling Water.
14. (Previously presented) The laminate attached to window glass of claim 1, wherein said attachable pressure sensitive adhesive layer comprises an adhesive including a cross linker solution.

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15. (Previously presented) The laminate attached to window glass of claim 1, wherein the laminate attached to the window glass has a percent haze less than or equal to about 2.0%.

16. (Previously presented) The laminate attached to window glass of claim 1, wherein the laminate attached to the window glass has a percent visible light transmission greater than or equal to about 88.6%.

17. (Previously presented) The laminate attached to window glass of claim 1, wherein the laminate attached to the window glass provides a glazing element which also passes each of the following ANSI Z-26 tests:

- 5.13 – Thirty Foot Ball (9.14 m) Drop;
- 5.17 – Resistance to Abrasion;
- 5.19 – Chemical Resistance; and
- 5.23 – Flammability.

18. (Previously presented) The laminate attached to window glass of claim 1, wherein each of said visible light transmissive pressure sensitive adhesive layers comprises an adhesive sufficient to maintain the laminae together through the ANSI Z-26 test: 5.04 – Two Hour Boiling Water.

19. (Previously presented) The glazing element of claim 9, wherein it passes the ANSI Z-26 test: 5.04 – Two Hour Boiling Water.

20. (Previously presented) The glazing element of claim 19, wherein it also passes at least one of the following ANSI Z-26 tests:

- 5.13 – Thirty Foot Ball (9.14 m) Drop;
- 5.17 – Resistance to Abrasion;
- 5.19 – Chemical Resistance; and
- 5.23 – Flammability.

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21. (Previously presented) The glazing element of claim 19, wherein it also passes each of the following ANSI Z-26 tests:

- 5.13 – Thirty Foot Ball (9.14 m) Drop;
- 5.17 – Resistance to Abrasion;
- 5.19 – Chemical Resistance; and
- 5.23 – Flammability.

22. (Previously presented) The glazing element of claim 9, wherein it has a percent haze less than or equal to about 2.0%.

23. (Previously presented) The glazing element of claim 9, wherein it has a percent visible light transmission greater than or equal to about 88.6%.

24. (Previously presented) A light transmissive laminate suited for attachment to window glass to provide a glazing element which has reduced spall and lacerative consequences on impact fracture of the window glass; said laminate comprising:

- (a) a first lamina comprised of visible light transmissive flexible nonadhesive polymeric material having a first major surface and an opposite second major surface;
- (b) a scratch-resistant layer over said first major surface to provide an exposed surface to the laminate;
- (c) at least one additional lamina comprised of visible light transmissive flexible nonadhesive polymeric material;
- (d) a sufficient number of layers of in situ visible light transmissive pressure sensitive adhesive layers to bond said laminate together with the scratch-resistant layer exposed;
- (e) a layer of in situ visible light transmissive ambient temperature attachable pressure sensitive adhesive to bond said laminate to window glass; and

wherein the total thickness of the laminate exceeds about 5 mils, the laminate exhibits a light transmittance of at least about 75% and said pressure sensitive adhesive layers are comprised of pressure sensitive adhesive having a shear storage modulus measured at 22°C in the range of about 0.20 MPa to about 0.50 MPa.

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25. (Previously presented) The laminate of claim 24, wherein once attached to window glass has a percent haze less than or equal to about 2.0%.
26. (Previously presented) The laminate of claim 24, wherein it exhibits a light transmittance of at least about 85%.
27. (Previously presented) The laminate of claim 24, wherein said attachable pressure sensitive adhesive layer comprises an adhesive including a cross linker solution.
28. (Previously presented) The laminate attached to window glass of claim 1, wherein the laminate comprises an optically clear laminate.
29. (Previously presented) The glazing element of claim 9, wherein the glazing element comprises an optically clear glazing element.
30. (Previously presented) The laminate of claim 12, wherein the laminate comprises an optically clear laminate.
31. (Previously presented) The laminate attached to window glass of claim 1, wherein said scratch-resistant layer comprises a scratch-resistant hard coating.
32. (Previously presented) The laminate attached to window glass of claim 1, wherein said pressure sensitive adhesive layers directly bond said laminae together.
33. (Previously presented) The glazing element of claim 9, wherein said pressure sensitive adhesive layers directly bond said laminae together.
34. (Previously presented) The laminate of claim 24, wherein said pressure sensitive adhesive layers directly bond said laminae together.

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35. (Previously presented) The glazing element of claim 9, wherein said attachable pressure sensitive adhesive comprises a cross linker solution.
36. (Previously presented) The laminate attached to window glass of claim 1, wherein the laminate exhibits a light transmittance of at least about 75%.
37. (Previously presented) A glazing element as set forth in claim 9, wherein the laminate exhibits a light transmittance of at least about 75%.
38. (Previously presented) A laminate attached to window glass as set forth in claim 1, wherein said first lamina is comprised of optically clear flexible nonadhesive polymeric material, said at least one additional lamina is comprised of optically clear flexible nonadhesive polymeric material, said sufficient number of layers of in situ adhesive layers comprise optically clear pressure sensitive adhesive layers, and said layer of in situ ambient temperature attachable pressure sensitive adhesive comprises an optically clear ambient temperature attachable pressure sensitive adhesive.
39. (Previously presented) A glazing element as set forth in claim 9, wherein said first lamina is comprised of optically clear flexible polymeric material, said at least one additional lamina is comprised of optically clear flexible polymeric material, said sufficient number of layers of in situ adhesive layers comprise optically clear pressure sensitive adhesive layers, and said layer of in situ ambient temperature attachable pressure sensitive adhesive comprises an optically clear ambient temperature attachable pressure sensitive adhesive.
40. (Previously presented) A light transmissive laminate as set forth in claim 24, wherein said first lamina is comprised of optically clear flexible nonadhesive polymeric material, said at least one additional lamina is comprised of optically clear flexible nonadhesive polymeric material, said sufficient number of layers of in situ adhesive layers comprise optically clear pressure sensitive adhesive layers, and said layer of in situ ambient temperature attachable pressure

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sensitive adhesive comprises an optically clear ambient temperature attachable pressure sensitive adhesive.